Feb. 12, 1924. 1,483,435

S. HAMMER

DETACHABLE HANDLE

Filed July 27, 1921

Fig. 1

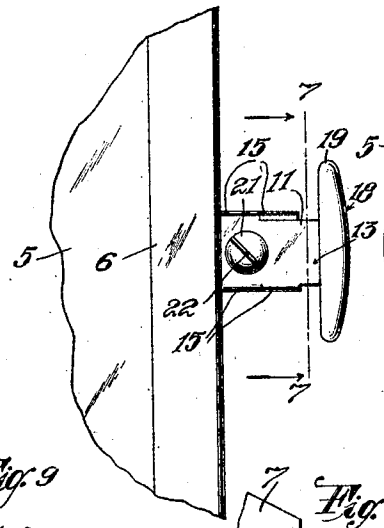


Fig. 2

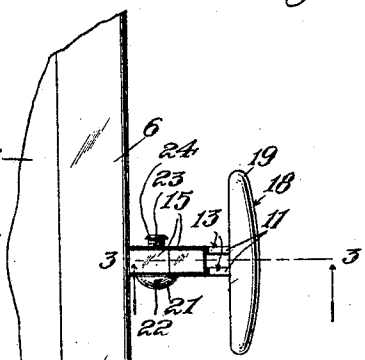


Fig. 9

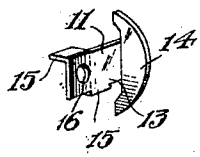


Fig. 6

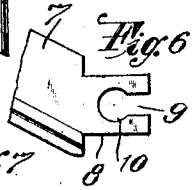


Fig. 10

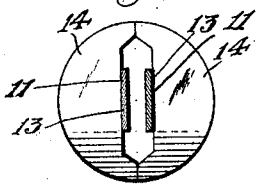


Fig. 7

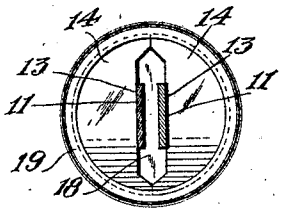


Fig. 4

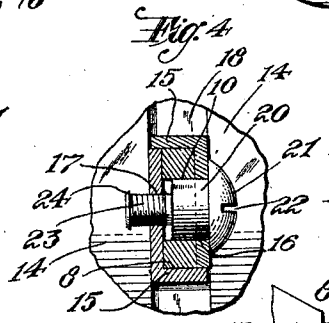


Fig. 3

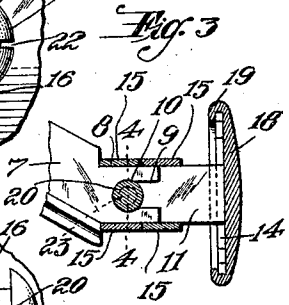


Fig. 8

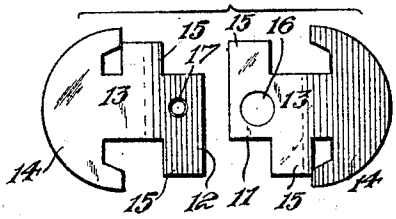
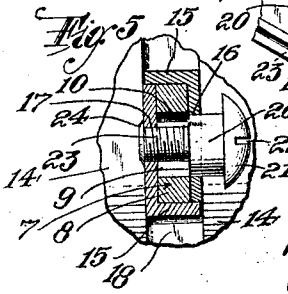


Fig. 5



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UNITED STATES PATENT OFFICE.

SAMUEL HAMMER, OF NEW YORK, N. Y., ASSIGNOR TO UNITED METAL BOX CO., INC., OF LONG ISLAND CITY, NEW YORK, A CORPORATION OF NEW YORK.

DETACHABLE HANDLE.

Application filed July 27, 1921. Serial No. 488,037.

To all whom it may concern:

Be it known that I, SAMUEL HAMMER, a citizen of the Republic of Russia, and resident of the borough of Bronx, city and State of New York, have invented certain new and useful Improvements in Detachable Handles, of which the following is a specification.

This invention relates to detachable handles and has for its primary object to provide a handle particularly designed for use in connection with switch levers of that type wherein one end of the lever projects exteriorly of a box or housing within which the operating parts of the switch are enclosed.

It is the primary purpose of the present invention to provide a detachable handle or knob which is of such construction that it may be quickly and rigidly fixed to the end of the lever or readily detached therefrom and placed within the box or housing, together with the switch lever, in order to prevent the operation of the switch or to permit of the compact piling or arrangement of the boxes in transportation.

The invention has for a further object to provide an improved connecting means between the handle shank and the end of the switch lever embodying an adjustable screw having a part co-acting with the switch lever to prevent longitudinal movement of the handle shank, said screw also operating to cause the opposite side portions of the shank to tightly clamp against the opposite side faces of the lever.

In one construction of the present invention, I propose to provide the handle shank with laterally spaced side portions between which the end of the lever is received and in one of these side portions of the handle shank a screw is loosely mounted, said screw having a threaded portion engaged in a threaded opening in the other side portion of the shank. The end of the screw is provided with a bur in order to prevent the disconnection of the screw from the handle shank. The end of the lever has a longitudinal slot enlarged at its inner end. In applying the handle the threaded portion of the screw moves into the inner end of said slot and the screw is then adjusted to position a portion of the screw shank of relatively large diameter in the enlarged end of the slot. A continued adjustment of the screw acts to urge the opposite side portions of the handle shank inwardly and thereby tightly clamp the same against the side faces of the lever.

The invention also has for an important object to provide a knob or handle which in itself is of novel construction, said handle being formed of three stamped metal parts, including two shank portions and a head portion. Each shank portion is provided at one of its ends with a disc section and the marginal edge of the head is adapted to be turned around the edges of said disc sections and tightly clamped thereon. In this manner, a knob or handle of simple and durable construction and of neat appearance is provided.

With the above and other objects in view the invention consists in the improved form, construction and relative arrangement of the several parts as will be hereinafter more fully described, illustrated in the accompanying drawings and subsequently incorporated in the subjoined claims.

In the drawings, wherein I have illustrated one very practical and satisfactory embodiment of the invention and in which similar reference characters designate corresponding parts throughout the several views:

Figure 1 is a fragmentary side elevation of a switch box with the cover in closed position, showing my improved detachable handle applied to the switch lever;

Figure 2 is a top plan view;

Figure 3 is a section taken on the line 3—3 of Figure 2;

Figure 4 is a section taken on the line 4—4 of Figure 3;

Figure 5 is a view similar to Figure 4 showing the arrangement of the connecting screw in the handle shank in attaching the shank to the lever or detaching the same therefrom;

Figure 6 is a detail elevation of the end of the switch lever;

Figure 7 is a section taken on the line 7—7 of Figure 1;

Figure 8 is a detail plan view of the two blanks from which the parts of the handle shank are formed;

Figure 9 is a detail perspective view of one part of the handle shank, and

Figure 10 is a detail view showing the two parts of the shank assembled before applying the head of the handle thereto.

In the accompanying drawings, I have illustrated my present invention as applied to the operating lever of an electric switch. It will be manifest, however, from the following description that the present invention is not limited in its utility to this specific application, but may likewise be serviceably employed in many other instances where a quickly detachable knob or handle for an operating lever is desired. As herein shown, the portion of the body of the switch box is designated at 5, said box being provided with the usual hinged cover 6 to permit of access to the interior of the box for the purpose of making repairs. When this cover is locked in its closed position the operating lever 7 for the movable switch part projects through a slot or opening in the wall of the cover 6. In the application and use of my present invention the end of this switch lever is provided with a longitudinally projecting reduced portion 8 which extends at an angle with respect to the plane of the lever. This reduced end of the lever is formed with a longitudinal slot 9, opening at one of its ends upon the end edge of the portion 8 of the lever. The slot 9 at its inner end is provided with a circular enlargement 10 for a purpose which will hereinafter appear.

The handle or knob includes two similar shank portions 11 and 12 respectively. Each of these shank portions is cut or stamped out into the blank form shown in Figure 8 to provide an arm 13 having a semi-circular portion or disc section 14 at one of its ends. Rectangular lugs 15 project from the opposite longitudinal edges of the arm 13, said lugs being out of alignment with each other. In the end of the arm 13 of the shank member 11 an opening 16 is formed, while in the corresponding end of the other shank member 12, an opening 17 of smaller diameter than the opening 16 is provided, said opening 17 having its wall threaded.

The other part of the shank or handle comprises a circular head 18, preferably having a relatively thick central portion. These several parts of the handle may be stamped from heavy sheet brass or other metal, and the two sections 11 and 12 of the shank are subsequently operated upon and the semi-circular end portions 14 thereof are bent into planes at right angles to the arm 13, while the lugs 15 are also bent at right angles to the plane of said arm and project in the same direction from the opposite side of the arm with respect to the disc sections 14. The two parts of the shank are then arranged in parallel relation with the opposed edges of the disc sections 14 in abutting contact with each other, as shown in Figure 10. The head 18 is then applied against the outer sides of these disc sections and the marginal portion of the head plate is bent inwardly over the edges of the disc sections to form a bead 19, which is tightly clamped against the inner faces of said disc sections. Thus, the three parts of the handle are rigidly connected to each other without employing screws or analogous fastening elements.

From reference to Figure 8, it will be noted that when the two parts of the shank are assembled, the angularly projecting lugs 15 on the opposed arms 13 of the shank are out of alignment with each other, so that said lugs bridge the space between the two shank sections and lap over upon the edges of the opposed section.

The attaching or fastening screw for the handle has a shank portion 20 of relatively large diameter at one end of which the head 21 is formed, said head being provided with the usual kerf to receive a screw-driving bit. From the other end of this portion 20 of the screw, the threaded shank 23 of relatively small diameter extends and has threaded engagement with the threads of the opening 17 in one of the shank arms 13, while the part 20 of the screw has a loose fitting engagement in the opening 16 of the other shank arm. The end of the threaded portion 20 of the screw is swaged or formed with a burr 24. Thus, it will be apparent that the part 23 of the screw cannot be unthreaded from the shank arm, but said screw remains permanently connected to the handle shank.

In connecting the handle to the lever 7, the screw is first adjusted in the handle shank to the position seen in Figure 5 of the drawings, wherein it will be noted that the screw has been moved to its limit in one direction until the burr 24 at the end thereof engages one side of the shank. The reduced projecting end 8 of the lever is now engaged between the spaced side portions of the shank, said side portions and the lugs 15 thereon providing what is in effect a tubular shank or sleeve. The treaded part 23 of the screw carried by the shank moves freely through the slot 9 into the inner end 10 thereof. The screw is now adjusted by engaging the driving bit with the head 21 and moved to the position seen in Figure 4 of the drawings. In this adjustment the part 20 of the screw is moved into the enlarged end 10 of the slot 9 and when so positioned it is obvious that the handle shank is securely held against any longitudinal movement with respect to the lever. In the continued adjustment of the screw, the head 21 thereof bearing against one of the side arms 13 of the shank and the screw portion 23 coacting with the other side arm of said shank results in an inward movement of said arms towards each other so that they are forced into tight clamping engagement against the opposite side

faces of the lever. This additional clamping action results in a very rigid connection of the handle to the end of the lever and effectively prevents any possible relative movement, which might result from an inaccurate fit of the part 20 of the screw in the inner end of the slot 9.

When the handle is applied in the manner above described, the inner end of the handle shank engaging the wall of the cover thus acts as a stop to limit the inward movement of the lever when the switch is moved to closed position. Frequently, such switches are subjected to more or less rough usage and considerable force is applied in the operation of the switch lever. However, in view of my improved connecting means between the handle shank and the end of the lever, such connection will successfully withstand a very severe shock or jar without resulting in a loosening of the connection.

A detachable handle constructed in accordance with my invention has many practical advantages. Among others may be mentioned the economy of space in packing the switch boxes for shipment, which is possible. Thus, before the box is closed, the handle may be attached to the lever and said lever then swung with respect to the movable switch part and folded so that the lever and the handle are wholly disposed within the box. The cover is then closed. Thus there are no projecting parts whatever which would interfere with the piling of the boxes in tiers with the boxes disposed in parallel relation to each other. At the same time since the handle is attached to the lever and not separately packed, there is no possiblity of the handle becoming lost. When the purchaser receives the switch box it is only necessary to open the same and detach the handle from the end of the lever. The lever is then extended through the opening or slot in the cover wall and the handle again attached to the exteriorly projecting end of the lever, in the manner above explained. The switch is now ready for operation. Again, as the attaching and securing screw remains permanently connected to the shank of the handle, this screw cannot become misplaced or lost when the handle is temporarily disconnected from the lever. In many cases after the switch has been installed, there are periods when it is desirable to prevent the operation of the switch. This may be readily done by simply detaching the handle and folding the lever within the box. The handle may either be connected to the lever or simply placed within the switch box, after which the box cover is closed and locked. Since, in the folded position of the lever within the box, it is not possible to operate the movable switch part from the exterior of the box, it is apparent that the current cannot be used.

From the foregoing description considered in connection with the accompanying drawings, the construction, manner of use and several advantages of the invention will be readily understod. In view of the very simple construction of the several parts of my improved detachable lever handle it will be appreciated that the device can be manufactured at relatively small cost without material increase in the selling price of the switch or other article to which the handle is applied.

I have herein disclosed what I have found to be a very satisfactory embodiment of the invention. It will be apparent, however, that the device is capable of embodiment in various other alternative constructions and I accordingly reserve the privilege of resorting to all such legitimate changes in the form, proportion and arrangement of the several parts as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:

1. In combination with an operating lever, a detachable handle therefor having shank sections provided with oppositely disposed aligned apertures of different diameters, and an adjustable element permanently connected to the handle in locked engagement with said lever, and having a free rotatable engagement with one of the apertures of said shank sections, and a threaded engagement with the opposite aperture.

2. In combination with an operating lever, a detachable handle therefor having shank sections provided with oppositely disposed aligned apertures of different diameters, and an adjustable element in locked engagement with said lever, one part of said element having a free rotatable engagement with one of the apertures of said shank sections and another part having a threaded engagement with the opposite aperture of said sections.

3. In combination with an operating lever having a slot open at one end and enlarged at its other end, a detachable handle for said lever having spaced parts between which the lever end is adapted to be engaged, and means for connecting the handle to the lever or disconnecting the same therefrom, including an adjustable element freely rotatable in one of said spaced parts of the handle and threaded in the other part thereof, said element having a portion adapted to enter the enlarged end of said slot in the lever and prevent longitudinal movement of the handle thereon, and said adjustable element also acting to urge the spaced parts of the handle into clamping engagement against the opposite sides of the lever.

4. In combination with an operating lever

having a slot open at one end and enlarged at its other end, a detachable handle for said lever having spaced parallel shank portions between which the end of the lever is adapted to be engaged, a screw freely rotatable in one of said shank portions of the handle and having threaded engagement in the other shank portion, means for preventing disconnection of the screw from the handle shank, said screw having a portion adapted to enter the enlarged end of the slot in the lever to prevent longitudinal movement of the handle thereon and also acting to urge the spaced portions of the handle shank into clamping engagement against the opposite sides of the lever.

5. A handle for levers including complementary shank sections, each having an arm and a disc section on one end of said arm disposed in a plane at right angles to the arm, and a head engaged against one side of said disc sections and having its marginal edge portion turned over the edges of the disc sections and clamped thereon.

6. A handle for levers comprising complementary shank sections, each having an arm, a head secured to one end of the arms and holding the same in opposed parallel relation to each other, each of said arms having lugs on its opposite edges extending at right angles to the plane of the arm, said lugs bridging the space between said arms and providing a guide sleeve to receive the end of the lever, and means permanently mounted in the shank arms for detachably connecting the handle of the lever.

In testimony that I claim the foregoing as my invention, and I have signed my name hereunder.

SAMUEL HAMMER.